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NASA-16700 (March 2003)
NASA - KSC
SUPERSEDING NASA-16700 (April 2001)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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SECTION 16700

BASIC PREMISE DISTRIBUTION SYSTEM (PDS) REQUIREMENTS

03/03

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NASA-16700 (March 2003)
NATIONAL AERONAUTICS **NASA - KSC**
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SECTION 16700

BASIC PREMISE DISTRIBUTION SYSTEM (PDS) REQUIREMENTS
03/03

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NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers requirements common to all premise wiring sections and should be included in all project specifications which contain any sections of Division 16701, "Communication/Equipment Room and Entrance Facilities," 16704, "Premise Wiring Systems," 16705, "Timing and Countdown System," 16801, "Paging and Area Warning System," and 16802, "Broadband Communication System (BCDS)". Accordingly, this section should be tailored carefully to suit project conditions and to meet project requirements and must be checked with Division 1 to avoid conflicts or repetition.

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: The following references should not be manually edited except to add new references. References not used in the text will automatically be deleted from this section of the project specification.

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The publications listed below form a part of this section to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E814	(1997) Standard Test Method for Fire Tests of Through Penetration Firestops

ELECTRONIC INDUSTRIES ALLIANCE (EIA)

EIA ANSI/TIA/EIA-568-A	(1995) Commercial Building Telecommunications Cabling Standard
EIA ANSI/TIA/EIA-606	(1993) Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
EIA ANSI/TIA/EIA-607	(1994) Commercial Building Grounding and Bonding Requirements for Telecommunications

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1999) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 1479	(1994) Standard for Safety for Fire Tests of Through-Penetration Firestops

1.2 SYSTEM DESCRIPTION

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NOTE: Review submittal description (SD) definitions in Section 01300, "Submittals," and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control. Include a columnar list of appropriate products and tests beneath each submittal description.

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The premise distribution system shall consist of inside-plant horizontal, riser, and backbone cables and connecting hardware to transport signals between equipment items in a building.

Premise distribution systems to be provided under this contract include:

[Telephone]
[Data (LAN)]
[KCCS]
[Timing and Countdown]
[Paging and Area Warning (P/AW)]
[Operational Intercom, (OIS-D)]

Work associated with these systems under this contract shall include the following:

a. All spaces, pathways, cable, and terminations, etc., comprising a complete structured cable system. Contractor shall provide any supplementary systems required to meet the performance

requirements of the system as part of the bid.

b. All work within the communications equipment room and communications closet, horizontal and backbone distribution, including but not limited to:

1. Installation of backbone cable and station/outlet wiring as indicated or otherwise required.

2. Installation of equipment racks, patch panels, and associated bonding and grounding systems, which comply with EIA ANSI/TIA/EIA-607.

3. Termination of all cables and wiring compliant with EIA ANSI/TIA/EIA-568-A, and applicable amendments.

4. Contractor shall provide all cables for interconnections of all electronic components including necessary jumper/patch cables, cross-connects, etc.

1.3 ENVIRONMENTAL REQUIREMENTS

Connecting hardware shall be rated for operation under ambient conditions of 0 to 60 degrees C, and in the range of 0 to 95 percent relative humidity, non condensing. The space in which it is to be installed and operate.

1.4 QUALIFICATIONS

1.4.1 Minimum Contractor Qualifications

All communication cable installation, termination, and testing, shall be performed by, and all equipment shall be furnished and installed by, a certified Telecommunications Contractor, hereafter referred to as the Contractor. With the exception of furnishing and installing conduit, electrical boxes, and pull wires, this work shall not be done by the Electrical Sub-Contractor, unless the below listed qualifications are met. The Contractor shall have the following qualifications in Telecommunications Systems installation:

a. Supervisors and installers performing work in the project, shall have completed the BICSI Cabling Installation Workshop and be BICSI Certified Installers. Supervisors shall have attained the rating of "Technician", and installers shall have attained the rating of "Installer". Submit documentation confirming the above credentials. General electrical trade staff (electricians) shall not be used for the installation of the premise distribution system cables and associated hardware.

b. For performance-based systems such as CAT 5E requiring a manufacturer's backed warranty, the installing Contractor shall be a certified, factory trained partner or Value-Added Reseller (V.A.R.) of the manufacturer backing the warranty.

1.4.2 Minimum Manufacturer Qualifications

The equipment and hardware provided under this contract shall be from manufacturers that have a minimum of 5 years experience in producing the types of systems and equipment specified.

1.5 SUBMITTALS

The following shall be submitted in accordance with Section 01330, "Submittals," in sufficient detail to show full compliance with the specification:

SD-07 Certificates

The qualifications of the Manufacturer, Contractor, and the Installer to perform the work specified herein. This shall include proof of the minimum qualifications specified herein. Each document shall be clearly labeled in accordance with paragraph entitled, "Qualifications," of this section.

1.6 DELIVERY AND STORAGE

Equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variation, dirt and dust or other contaminants.

1.7 OPERATION AND MAINTENANCE MANUALS

Commercial off-the-shelf manuals shall be furnished for operation, installation, configuration, and maintenance for all products provided as a part of the premise distribution system. Specification sheets for all cable, connectors, and other equipment shall be provided.

1.8 RECORD KEEPING AND DOCUMENTATION

1.8.1 Cables

A record of all installed cable shall be provided in hard copy format and on electronic media using Windows based software. Coordinate with the Contracting Officer to confirm the file format in which to provide the electronic copy. The cable records shall include the required data fields for each cable and complete end-to-end circuit report for each complete circuit from the assigned outlet to the entry facility, per EIA ANSI/TIA/EIA-606.

1.8.2 Termination Hardware

A record of all installed patch panels and outlets shall be provided in hard copy format and on electronic media. See respective system sections for format of electronic media. The hardware records shall include only the required data fields, per EIA ANSI/TIA/EIA-606.

PART 2 PRODUCTS

2.1 FACTORY ASSEMBLED PRODUCTS

Provide maximum standardization of components to reduce spare part requirements. Manufacturers of equipment assemblies that include components made by others shall assume complete responsibility for final assembled unit. All components of an assembled unit need not be products of same manufacturer. Constituent parts, which are alike, shall be product of a single manufacturer. Components shall be compatible with each other and with the total assembly for intended service.

Components of equipment shall bear manufacturer's name or trademark, model number and serial number on a name plate securely affixed in a conspicuous place, or cast integral with, stamped or otherwise permanently marked upon the components of the equipment. Major items of equipment that serve the same function must be the same make and model. Exception will be permitted if performance requirements can not be met.

2.2 COMPATIBILITY OF RELATED EQUIPMENT

Equipment and materials installed shall be compatible in all respects, with other items being furnished and with existing items so that a complete and fully operational system will result. Provide maximum standardization of components to reduce spare part requirements. Manufacturers of equipment assemblies that include components made by others shall assume complete responsibility for final assembled unit.

All components of an assembled unit need not be products of same manufacturer. Constituent parts that are alike shall be product of a single manufacturer. Contractor shall guarantee performance of assemblies of components, and shall repair or replace elements of the assemblies as required to deliver specified performance of the complete assembly. Components of equipment shall bear manufacturer's name or trademark, model number and serial number on a name plate securely affixed in a conspicuous place, or cast integral with, stamped or otherwise permanently marked upon the components of the equipment.

2.3 SPECIAL TOOLS

If any part of equipment requires a special tool for assembly, adjustment or maintenance thereof, and such tool is not readily available on commercial tool market, it shall be furnished by the Contractor.

2.4 LIFTING ATTACHMENTS

Provide equipment with suitable lifting attachments to enable equipment to be lifted in its normal position. Lifting attachments shall withstand any handling conditions that might be encountered without bending or distortion of shape, such as rapid lowering and braking of load.

2.5 FIRESTOPPING

Firestopping for Openings through fire and smoke rated walls and floor assemblies shall be listed or classified by an approved independent testing laboratory for "Through-Penetration Firestop Systems". The system shall

meet the requirements of "Fire Tests of Through-Penetration Firestops", designated in ASTM E814, or UL 1479.

Inside of all conduits, the firestop system shall consist of a dielectric, water resistant, non-hardening, permanently pliable/re-enterable putty along with the appropriate damming or backer materials (where required). The sealant must be capable of being removed and reinstalled and must adhere to all penetrants and common construction materials, and shall be capable of allowing normal wire/cable movement without being displaced.

The Contractor shall patch all openings remaining around and inside all conduit, sleeves, and cable penetrations to maintain the integrity of any fire rated wall, ceiling, floor, etc. All building conduits and sleeves installed and/or used under this contract shall be firestopped, or re-firestopped upon cable placement through such passageways. Manufacturer's recommended installation standards must be closely followed (i.e. minimum depth of material, use of ceramic fiber and installation procedures).

PART 3 EXECUTION

3.1 GENERAL

3.1.1 Installation

System components and appurtenances shall be installed in accordance with all applicable codes, manufacturer's instructions, and as shown. Necessary interconnections, services, and adjustments required for a complete and operable signal distribution system shall be provided. Components shall be labeled in accordance with EIA ANSI/TIA/EIA-606. Penetrations in fire-rated construction shall be firestopped in accordance with FIRESTOPPING in this specification. Conduits, outlets and raceways shall be installed in accordance applicable sections of this specification.

Wiring shall be installed in accordance with EIA ANSI/TIA/EIA-568-A, and as specified in these specifications. Cables shall not be installed in the same cable tray, utility pole compartment, or floor trench compartment with ac power cables. Cables not installed in conduit or wireways shall be properly secured and neat in appearance and, if installed in plenums or other spaces used for environmental air, shall comply with NFPA 70 requirements for this type of installation.

3.1.2 Rough-In

All equipment locations shall be coordinated with other trades, other renovation projects, and existing conditions to eliminate interference with required clearances for equipment maintenance and inspections. Coordinate work with other trades and existing conditions to determine exact routing of all cable tray, hangers, conduit, etc., before fabrication and installation. Verify with Contracting Officer exact location and mounting height of all equipment in finished areas, such as equipment racks, communication and electrical devices.

Where more than one trade is involved in an area, space or chase, all shall

cooperate and install their own work to utilize the space equally between them in proportion to their individual requirements. There will be no priority schedule for trades. If, after installation of any equipment, piping, ducts, conduit, and boxes, it is determined that ample maintenance and passage space has not been provided, rearrange work and/or furnish other equipment as required for ample maintenance space. Any changes in the size or location of the material or equipment supplied or proposed, which may be necessary in order to meet field conditions or in order to avoid conflicts between trades, shall be brought to the immediate attention of the Contracting Officer, and approval received before such alterations are made.

Provide mandated clearances at equipment racks and enclosures, and other equipment requiring maintenance and operation. The Contractor shall be responsible for all required locations, cutting, patching, coring and associated work for the complete cabling system, at no additional cost to the Government.

3.1.3 Cutting and Patching

Contractor shall include the required cutting and patching work to perform work. Cut and drill from both sides of walls and/or floors to eliminate splaying. Patch adjacent existing work disturbed by installation of new work including insulation, walls and wall covering, ceiling and floor covering, and other finished surfaces. Patch and/or paint openings and damaged areas equal to existing surface finish. Cut openings in pre-fabricated construction units in accordance with manufacturer's instructions.

3.1.4 Supports

Provide required supports, beams, angles, hangers, rods, bases, braces, straps, struts, and other items to properly support contract work. Modify studs, add studs, add framing, or otherwise reinforce studs in metal stud walls and partitions as required to suit contract work. If necessary in stud walls, provide special supports from floor to structure above. For pre-cast panels/planks and metal decks, support communication work as recommended by manufacturer.

3.2 PREMISE DISTRIBUTION WIRING TO SYSTEMS FURNITURE

[Provide all tools, equipment, labor and materials required to install telecommunication outlets in work stations, as indicated on the drawings. Wiring shall transition from building raceway system (cable tray, bridle rings), to furniture raceway system, in a method as approved by the manufacturer. Where tele-power poles are necessary to transition wiring from above ceiling down to furniture panel, provide number and type of poles required. Route all wiring in the furniture panels in integral raceways.]

[Where systems furniture is indicated on the drawings but is not installed, neatly coil and label conductors for panel mounted outlets in ceiling space above proposed tele-power pole location or other connection point. Outlets located in fixed partitions that would be within workstation, shall be

completely installed as if systems furniture were installed.]

3.3 TELECOMMUNICATIONS OUTLET

3.3.1 Faceplates

As a minimum, each jack shall be labeled as to its function and a unique number to identify cable link.

3.3.2 Cables

Unshielded twisted pair cables shall have a minimum of 150 mm of slack cable loosely coiled into the telecommunications outlet boxes. Minimum manufacturers bend radius for each type of cable shall not be exceeded.

3.3.3 Pull Cords

Pull cords shall be installed in all conduit serving telecommunications outlets which do not initially have cable installed.

3.4 TERMINAL BLOCKS

Terminal blocks shall be mounted in orderly rows and columns. Adequate vertical and horizontal wire routing areas shall be provided between groups of blocks. Industry standard wire routing guides shall be utilized.

3.5 EQUIPMENT RACKS AND CABINETS

Open frame equipment racks and cabinets shall be bolted to the floor slab. Cable guides shall be bolted or screwed to racks. Racks shall be installed level. Ganged racks shall be bolted together. Ganged rack cabinets shall have adjacent side panels removed. Wall mounted racks shall be secured to the mounting surface to prevent fully loaded racks from separating from the mounting surface.

3.6 RACK MOUNTED EQUIPMENT

Equipment to be rack mounted shall be securely fastened to racks by means of the manufacturer's recommended fasteners.

3.7 TERMINATION

All cables shall be terminated unless otherwise noted. Cables and conductors shall sweep into termination areas; cables and conductors shall not bend at right angles. Manufacturer's minimum bending radius shall not be exceeded. When there are multiple system type drops to individual workstations, relative position for each system shall be maintained on each system termination block or patch panel.

3.8 GROUNDING

Signal distribution system ground shall be installed in the telecommunications entrance facility and in each telecommunications closet, in accordance with EIA ANSI/TIA/EIA-607. Equipment racks shall be

connected to the electrical safety ground.

3.9 ADDITIONAL MATERIALS

The Contractor shall provide additional materials (spare parts) required for facility startup, as indicated in the respective specification sections.

3.10 ADMINISTRATION AND LABELING

3.10.1 Labeling

All labels shall be in accordance with EIA ANSI/TIA/EIA-606. Each connector shall be labeled at the faceplates as indicated on the drawings. All patch panels shall be labeled as indicated on the drawings. Labels shall not be handwritten, but shall be made using a device which produces a typewritten print on a permanent marking, to secure around cable in a permanent manner.

3.10.2 Testing

Materials and documentation to be furnished under this specification are subject to inspections and tests. All components shall be terminated prior to testing. Equipment and systems will not be accepted until the required inspections and tests have been made, demonstrating that the signal distribution system conforms to the specified requirements, and that the required equipment, systems, and documentation have been provided.

Each outlet shall be tested post-termination using an appropriate instrument to verify both the integrity of all conductors and correctness of the termination sequence.

3.11 FIRESTOPPING

Provide materials and products listed. The system shall meet the requirements of "Fire Tests of Through-Penetration Firestops" designated ASTM E814, to be used inside all conduits and sleeves. Caulk on exterior of conduit penetration. Provide firestop system seals at all locations where conduit, fiber, cable trays, cables/wires, and similar utilities pass through or penetrate fire rated wall or floor assembly. Provide firestop seal between sleeve and wall for drywall construction.

The minimum required fire resistance ratings of the wall or floor assembly shall be maintained by the firestop system. The installation shall provide an air and watertight seal. The methods used shall incorporate features/characteristics that permit the easy removal or addition of conduits or cables without drilling or use of special tools. The product shall adhere to itself to allow repairs to be made with the same material and permit the vibration, expansion and/or contraction of any items passing through the penetration without cracking, crumbling and resulting reduction in fire rating. Typical rating:

a. Floors - 3 hours.

b Corridor Walls - 2 hours.

c. Offices - 3/4 hour.

d. Smoke Partitions - 3/4 - 1 hour.

-- End of Section --